

AMENDMENTS TO THE CLAIMS

1. (Previously presented) A circuit, comprising:
a nonlinear transmission line circuit having an input and an output; and
a pulse-forming circuit coupled to the nonlinear transmission line, the pulse-forming circuit including a reverse-biased diode coupled in series with the output of the nonlinear transmission line circuit.
2. (Original) The circuit according to claim 1, further including a co-planar waveguide in which the nonlinear transmission line is disposed.
3. (Original) The circuit according to claim 1, wherein the circuit is fabricated from high-resistivity silicon.
4. (Original) The circuit according to claim 1, wherein the nonlinear transmission line includes
a plurality of reverse-biased Schottky diodes coupled to a central conductor.
5. (Original) The circuit according to claim 1, further including a gate device coupled to the pulse-forming circuit.
6. (Original) The circuit according to claim 5, further including a modulator coupled to the gate and a laser coupled to the modulator for generating optical pulses.
7. (Original) The circuit according to claim 6, wherein the modulator is a 10 GHz LiNbO₃ modulator.

8. (Original) The circuit according to claim 7, wherein the circuit generates signals at a rate of at least 10 Gbit/s.
9. (Original) The circuit according to claim 7, wherein the circuit generates optical pulses less than about 27 picoseconds FWHM.
10. (Original) The circuit according to claim 7, wherein the gate is a dual-gate FET.
11. (Original) The circuit according to claim 10, wherein the gate is a Si/SiGe heterostructure bipolar transistor.
12. (Currently amended) A data transmission system, comprising:
 - a nonlinear transmission line;
 - a pulse-forming circuit coupled to a first end of the nonlinear transmission line, a second end of the nonlinear transmission line adapted to be coupled to a periodic signal generator;
 - a gate coupled to the pulse-forming circuit;
 - an optical modulator coupled to the gate; and
 - a laser coupled to the modulator.
13. (Original) The system according to claim 12, wherein the system is integrated on a silicon substrate.
14. (Original) The system according to claim 12, wherein the gate includes a dual-gate FET.
15. (Original) The system according to claim 12, wherein the pulse-forming circuit includes a

reverse-biased diode.

16. (Currently amended) A method of generating optical pulses, comprising:
electrically modulating an output signal from a pulse-forming circuit coupled to a
first end of a nonlinear transmission line, a second end of the nonlinear transmission line coupled
to a periodic signal generator; and
modulating an output signal from the pulse-forming circuit with a laser-generated
signal to provide an optical signal.
17. (Original) The method according to claim 16, wherein the pulse-forming circuit includes a
reverse-biased diode coupled to the nonlinear transmission line.
18. (Original) The method according to claim 16, further including inserting the nonlinear
transmission line within a waveguide.
19. (Original) The method according to claim 16, further including fabricating the nonlinear
transmission line from high-resistivity silicon.
20. (Original) The method according to claim 16, further including integrating a gate, the
modulator, the laser, the nonlinear transmission line, and the pulse-forming circuit on a
silicon substrate.